

Insec(tc)ure*: Are you insecure about your insect cures?

A UT Urban IPM Lab Newsletter for the Pest Management Industry

Educational Opportunities to Advance Your Career in Pest Management

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Last week at the Tennessee Pest Control Association's Winter Conference, I spoke about the spate of retiring urban entomologists and the concern that the urban entomology pipeline was breaking or broken. Urban entomology is the study of insects and related arthropods found in and around structures. A generation of urban entomologists retired and not all were replaced. We discussed what would happen to urban entomology and support for the pest management industry and questioned if fewer urban entomology students would be trained to work in this industry. Since then, several PMPs confessed their passion for urban entomology and pest management. They wanted information about career paths and asked about educational opportunities to learn more about this field to gain knowledge and experience to move into more lucrative and rewarding positions in urban pest management. In this article, I offer options to increase your understanding of urban pest management, not the business's financial or personnel aspects.

The educational opportunities depend on your current education and years of experience. I assume anyone attending the TPCA meeting is already a TDA-certified pesticide applicator.

If you have a high school diploma or GED, you have the following options:

1. Read, read, read, read, read

Although slightly outdated, Truman's Scientific Guide to Pest Management Operations and the Mallis Handbook of Pest Control are the pillars of urban pest management. In addition, I list a few others books and websites that have been helpful to me over the years.

Books

Bennett, G.W., J.M. Owens, & R.M. Corrigan. 2011. Truman's Scientific Guide to Pest Management Operations, seventh edition. Questex Publishing, Cleveland, OH.

Doggett, S. L., D. M. Miller and C-Y Lee. 2017. Advances in the Biology and Management of Modern Bed Bugs. First Ed. Wiley-Blackwell, 472 pp.

Klotz, J., L. Hansen, R. Pospischil and M. Rust. 2008. Urban Ants of North America and Europe: Identification, Biology and Management. Comstock Publishing Associates, Cornell University Press, Ithaca, New York pp. 196

Mallis, A. 2011. Handbook of Pest Control - the Behavior, Life History and Control of Household Pests. 10th edition. Mallis Handbook L.L.C.

Wang, C., C-Y Lee and M.K. Rust. 2021. Biology and Management of the German Cockroach. CSIRO, Boston, MA.

Field Guides

- Hedges, S. 2010. Pest Control Technology Field Guide for the Management of Structure-Infesting Ants, 3rd edition. G.I.E. Inc. Publishers, Richfield, Ohio.
- Hedges, S. 1995. Pest Control Technology Field Guide for the Management of Structure-Infesting Flies. Franzak and Foster Co., Cleveland, Ohio.
- Hedges, S. 2012. Pest Control Technology Field Guide for the Management of Urban Spiders. Franzak and Foster Co., Cleveland, Ohio.
- Hedges, S. and M. Lacey. Structure-Infesting Beetles. Volume 1: Hide and Carpet Beetles/Wood-Boring Beetles. Franzak and Foster Co., Cleveland, Ohio.
- Hedges, S. and M. Lacey. Structure-Infesting Beetles. Volume 2: Stored Product Beetles/Occasional and Overwintering Beetles. Franzak and Foster Co.
- Smith, E and R. Whitman. 2007. NPMA Field Guide to Structural Pests. Second edition.
<http://npmapestworld.org/>
- NPMA Field Guide Pro is now available as an Android or iOS app,
<https://npmapestworld.org/resourcecenter/npma-field-guide-pro/>

Web sites for great insect photos

- <https://bugguide.net/node/view/15740>
- <https://www.insectimages.org/>
- <https://entnemdept.ufl.edu/creatures/>

If the above-printed items are cost-prohibitive, try our PSEP licensing manuals, psep.tennessee.edu/licensed-pest-control-operator/

- Vail, K.M., G. Burgess, R. Gerhardt and C. Harper [eds.]. 2007. PB 1673 General Pest and Rodent Control Pesticide Applicator Licensing Manual (GRC). pp. 130.
- Vail, K., D. Hensley, G. Burgess, C. Pless and A. Taylor [eds.]. 2014. PB 1703 Wood-Destroying Organisms Licensing Manual. pp. 76.
- Vail, K.M., E.E. Burgess, R. Gerhardt, C. Jones, J. Skinner and C. Harper. 2003. PB 1733. Public Health Pest Control (Category 8). pp. 99.

2. Register for the online editions of Pest Control Technology (<https://pctonline.com/>) and Pest Management Professional (<https://www.mypmp.net/>) and read every issue. You'll catch up on recent research and see the latest trends. If your company is a member of NPMA, they may also receive Pestworld magazine.

3. Take individual online classes

The National Pest Management Association (NPMA) offers about 30 online classes on structural pests
<https://npmapestworld.org/resourcecenter/online-training-resources/course-offerings/>

Many universities, distributors, and other private entities offer online classes too. Some are free, but most are fee-based. If you want pesticide applicators CEUs too, check the TDA. website at
<https://raccoon.healthspace.com/clients/tda/state/weblive.nsf/lookupSchool.xsp> for schools approved in Tennessee.

4. Enroll in a certificate program at universities offering such opportunities:

Purdue University "Correspondence" Courses: No prerequisites
https://www.eventreg.purdue.edu/eC2K/Heading.aspx?heading_id=983

Introduction to Urban and Industrial IPM (paper or online)
Advanced Urban and Industrial IPM (paper or online)
Termites and Other Wood-destroying Organisms (paper or online)
Bed Bug IPM (online)
Food Plant IPM (paper or online)
IPM in Public Buildings and Landscapes (paper or online)
Turf Grass IPM (paper or online)
Wildlife Damage IPM (paper or online)

5. Attend local, regional, state and national pest management meetings to network with other successful PMPs and learn from experienced professionals.
6. Become active on social media sites that discuss pest control, but be aware that the information on someone's blog, Twitter, Instagram, Facebook or other social media sites may not be research-based, whereas that produced by an Extension Urban Entomologist should.
7. Become licensed in the categories that your company services. The University of Tennessee Pesticide Safety Program (<https://psep.tennessee.edu/licensed-pest-control-operator/>) offers training in General Pest and Rodent Control (GRC) and Wood-destroying Organisms (WDO). It's advantageous for a company to have more than one licensee in each category so many will fund the training and test fees. To be eligible to take the licensing exams, most categories require two years of work experience, among other things. In some cases, educational experience reduces the work experience required.
8. There is no better way to learn than to teach. Ask if you can present your knowledge at the next company meeting. The thought of standing in front of peers and not being able to answer their questions is a tremendous motivator to study!

In addition to the above, if you have 5 years of verified pest management experience:

Become an Associate Certified Entomologist (ACE) <https://entocert.org/ace>, which *requires 5 years of verifiable pest management experience, a current pesticide applicator's license issued in the U.S., and the ability to pass a test on structural pest control knowledge* offered by the Entomological Society of America. If you are a certified applicator in Tennessee, then licensing is not required to take the ACE. The UT Urban IPM program offers an ACE Exam Prep Course each fall. See my website, <https://epp.tennessee.edu/directory/dr-karen-vail/> under Events for the current year's ACE training announcement. This training is nearly every Monday from September through December. The ACE exam is extremely difficult and I've seen estimates of 40% pass rates on the first attempt. Passing this exam should distinguish you and your company from your peers. As you add credentials to your repertoire, advancement opportunities in your company and elsewhere should increase.

If you are extremely serious about your urban entomology education, get an undergraduate degree in entomology or another biological field. This requires applying and being accepted by the university, **at least 4 years of full-time commitment** (about 120 credits), and a significant financial investment. It would be nearly impossible to work full-time as a pest control technician and obtain a bachelor's degree in four years. According to the Entomology Society of America (<https://www.entsoc.org/resources/education/undergraduate>), 16 universities offer an undergraduate degree in entomology ([Cornell University](#), [Michigan State University](#), [Ohio State University](#), [Oklahoma State University](#), [Purdue University](#), [Rutgers University](#), [Texas A&M University](#), [University of California, Davis](#), [University of California, Riverside](#), [University of Delaware](#), [University of Florida](#), [University of Georgia](#), [University of Idaho](#), [University of Illinois](#), [University](#)

[of Nebraska-Lincoln](#), and [University of Wisconsin-Madison](#). Of these, one offers a specialization in urban entomology at the undergraduate level ([University of Florida](#)) and some offer classes in urban entomology ([University of California, Riverside](#), [University of Florida](#), [Rutgers University](#)). Many universities (Rutgers University, Virginia Tech, University of Kentucky, Purdue University, University of Tennessee, North Carolina State University, Clemson University, University of Georgia, University of Florida, Auburn University, Mississippi State University, Louisiana State University, Texas A&M University, Oklahoma State University, University of Arkansas, University of Arizona, New Mexico State University, and University of California, Riverside) offer degrees in biology or similar subjects and currently have urban entomologists on the faculty that would allow you to conduct research on urban entomology projects.

An undergraduate degree and experience in urban entomology research, may open up opportunities into manufacturer or distributor sales or technical representatives, and technical directors for a smaller pest management company.

If you already have an undergraduate degree in a biological or other science, you could further explore urban entomology with graduate degrees through online programs that allow you to continue working while getting your degree. The University of Florida offers a MS online degree in Urban Pest Management (<https://onlineentomology.ifas.ufl.edu/programs/>). A few other universities offer online Master's degrees in entomology, but don't have an urban entomology class. Most of the universities listed above with urban entomologists offer in-person graduate degrees (Master's and Ph.D.s). I estimate about 2.5 yrs full-time for a Master's degree and an additional 3 – 5 years full-time for a Ph.D. Most students working on a graduate degree in person are typically on a research or teaching assistantship. At the University of Tennessee, the salary of a Master's student is \$20K and that of a PhD is \$22K per year. So getting a Master's degree and/or Ph.D. is a serious time commitment and will require financial belt-tightening. While working on my Master's degree I was paid \$5K per year but my tuition was paid by the institution. Job opportunities with a Master's degree in Entomology with experience in urban entomology research include technical support for a research laboratory in private industry or academia, county Extension agent, and possibly technical director for a medium-sized pest control company. With a Ph.D. in entomology and a research project in urban entomology, there's little to hold you back. Options include positions in research and development for pesticide manufacturers, technical director or other upper administration positions for a large pest management company, and faculty at a land-grant university, among others.

My journey was sigmoidal, moving forward but not in a straight line. I obtained my undergraduate from Rutgers University and researched insect pests of eggplant. I had to pay for this wonderful experience and was employed at a local supermarket on the weekends until I was hired into an entomology research lab as a student assistant. For my Master's degree at Virginia Tech, I worked on broccoli pests. At this point, I noticed all the graduate students in urban entomology were getting job offers in the pest management industry before they graduated. I liked that idea. For my PhD, I worked full-time as a biological technician at the USDA, Fire Ant and Household Insects Unit in Gainesville, which was a stone's throw from the University of Florida's Entomology and Nematology Department, where I obtained my Ph.D. on the foraging, spatial distribution and control of the Pharaoh ant. Before I had my diploma, I was hired at the University of Tennessee as the Extension Urban Entomologist. My higher education journey started in 1981 at Rutgers and ended in 1996 at UF. Not that my learning stopped, just my formal education. I learn something new each day, often from experiences with you or other professionals in the state!

I must say it's a thrilling time to be one of the remaining urban entomologists in academia and Extension. The pest control industry is experiencing an influx of new and inexperienced service technicians eager to learn. I hope technicians seeking additional educational opportunities are rewarded for their passion.

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Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label and registered for use in your state.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

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